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Art. X.—*Letter from* J. M. Heath, Esq., *on the Introduction of the American Plough into India.*

The following paper contains a description, with drawings annexed, of a plough, recently introduced from America into India, and which promises to prove of the greatest benefit to agriculture in that country.

In the year 1837, the Managing Directors of the Indian Iron and Steel Company, received a communication from Captain Foster, Superintendent of Roads, &c., at Poonah, to inquire whether such ploughs could be made up at the Porto Novo Iron Works, and on being informed that the ploughs could be made for a certain price, an order was received for the iron work of 400 ploughs, for the use of the Bombay Government. During the execution of this order, a few of the ploughs were sent to gentlemen in the revenue line under the Madras Presidency, who were desirous to give them a trial: and from their reports of their performance to the Revenue Board at Madras, an order was sent to Porto Novo in September last, for upwards of 800 of these ploughs, for the purpose of being distributed to each of the Collectors under the Madras Presidency: this order, I have recently heard, has been completed.

The superiority of the performance of this plough over that of the ploughs in use in India, was so manifest, that in almost all instances, when it was exhibited to the cultivators, they expressed a strong desire to procure the plough: and an application was made to the Porto Novo Iron Works, before I left India, on the part of several native gentlemen who possessed estates in the Madras territories, for a supply of these ploughs, for the purpose of distribution among their tenants.

The weight of the cast and wrought-iron work of one of these ploughs, is about 60 lbs.; the cost at which they were supplied at Porto Novo, was 10 rupees, or about 1*l.* each; they can be worked in light soil by a pair of bullocks or buffaloes; but when the cattle are small, two pair will be required; with two pair of bullocks, one of these ploughs will do more work in turning up the soil in an efficient manner, than double the number of cattle could do, in the same time, with the native plough. This plough is only suitable for the cultivation of dry grain soils; it is quite unfit for ploughing rice land.

DESCRIPTION.

This plough consists of four principal parts, which, for facility of reference, shall be called the mould-board, the shoe, the side-piece, and the curved bar.

The following explanations and a reference to the accompanying figures, will explain the meaning of these terms.

Nos. 1 and 2,—Show the appearance of the plough when put together; they are not reduced from actual measurements, but sketched merely for the purpose of conveying a more clear idea than could be done by description, of the different parts of the plough and their modes of connection.

No. 3,—Is a plan of the cast-iron parts, showing the different bolts, &c. This and the following figures are drawn upon the scale of two inches to a foot.

No. 4,—Is a section of the mould-board and shoe, perpendicular to the exterior edge of the latter, and showing their curve and mode of junction.

No. 5,—Is the furrow or outer side-elevation of the mould-board, showing the receptacle for the shoe and different bolt-holes.

Nos. 6 and 7,—Are horizontal and perpendicular sections of the same, which a reference to the figures will explain.

No. 8,—Is the reverse or inner side-elevation of the mould-board, exhibiting the projection for securing the side piece and curved-bar; this is effected by two bolts passing through the three pieces and secured by nuts inside.

No. 9,—Is a section of this projecting piece explained by the letters on the figure.

No. 10,—Is an elevation of the side piece, showing the position of the bolt-holes, and strengthening of lower part by an additional thickness of metal.

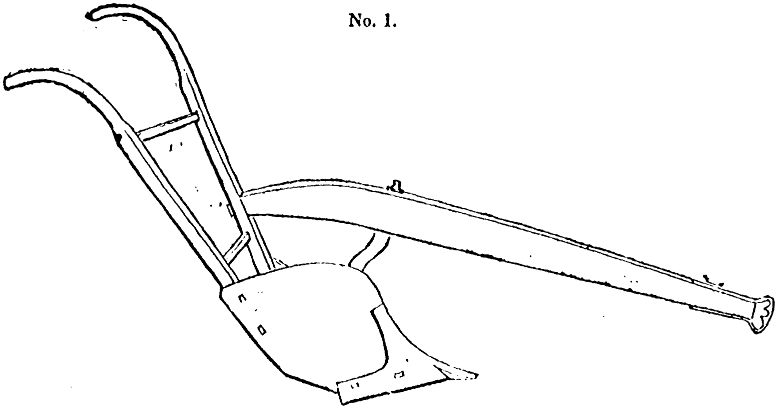
No. 11 and 12,—Are horizontal and perpendicular sections of the above, explained by the letters.

No. 13,—Inner side elevation of the shoe, with the bolts and nuts for securing it to mould-board.

No. 14,—Side elevation of the curved-bar and position of bolt-holes.

No. 15,—Front elevation of ditto.

No. 1.



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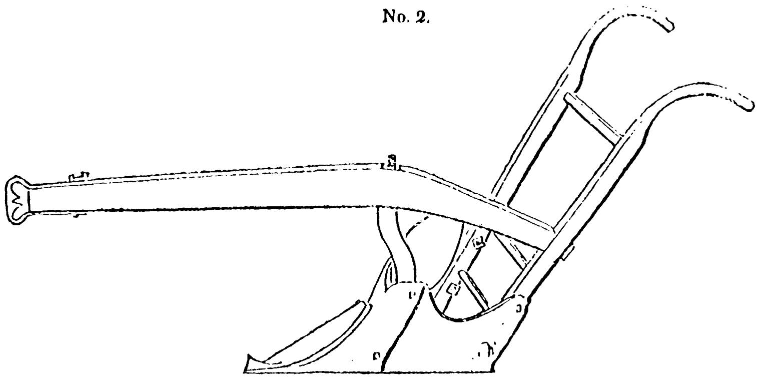

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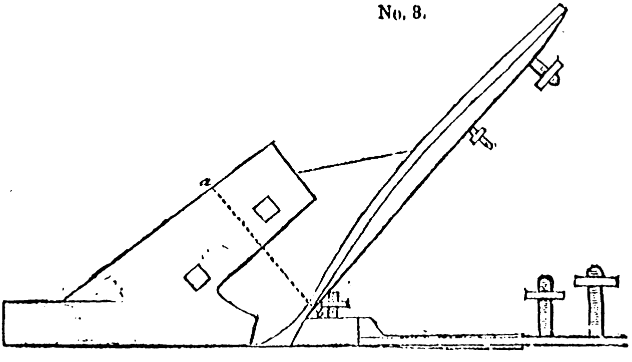

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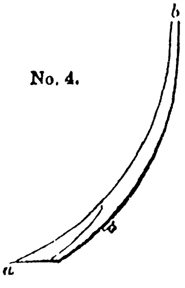

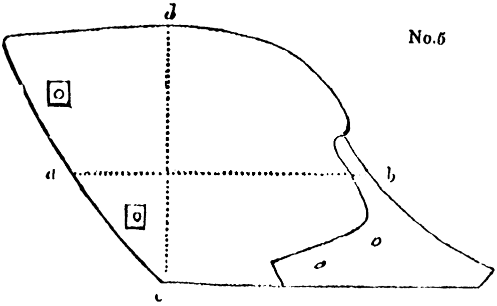
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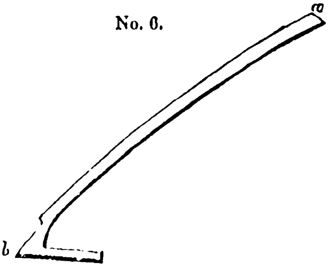
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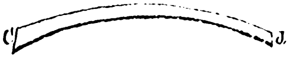
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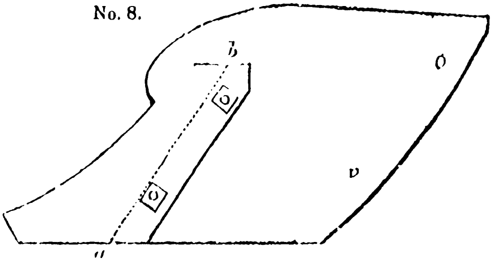
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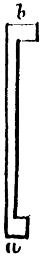
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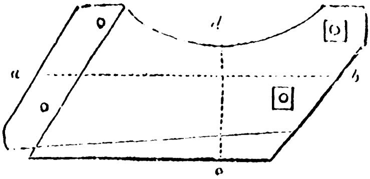
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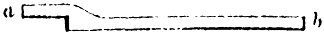
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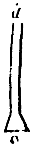
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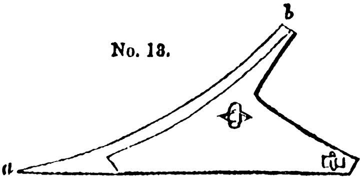
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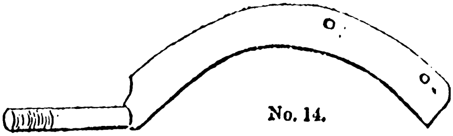
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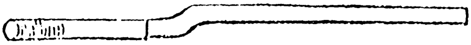
No. 15.

REMARKS.

The whole of the above pieces are made of cast-iron, with the exception of the curved-bar. The mould-board is a plate of cast-iron one-fourth of an inch thick at its upper edge, and gradually increasing to one-third or two-fifths of an inch at its lower. In the angle formed by the projecting piece on its inner side, the thickness of metal is not less than an inch.

The shoe (fig. 13,) is also a plate of cast-iron one-fourth of an inch thick, with a toe of solid metal projecting beyond it, of an inch in thickness in its greatest part. Its cutting edge (*a* 6, fig. 13,) is sharpened by a slight ridge of metal not shown in the figure.

The side piece is about one-fourth of an inch thick except at bottom, where it is strengthened by an additional thickness of metal.

The curved-bar ought to be of the best malleable iron, as in dragging the plough, it bears the principal strain, and is, consequently most liable to fracture. Its curve is adjusted so as to correspond exactly with the inner angle of the mould-board, in which it is placed. By this contrivance its strength is greatly increased, as will be evident on reflecting that the pressure, instead of being on a single point, is distributed along the whole portion of the curve in contact; it is, in fact, a hook by which the plough is dragged along, and the strain, instead of being transverse, is thus brought more nearly in the line of the axis of the bar, which position would, of course, be the most favourable for resistance to fracture.

This bar is two inches in depth by half an inch in thickness, and is terminated by a bolt and screw for attaching it to the pole of the plough. The bar is bent a little towards the upper end, to enable the bolt to pass perpendicularly through the axis of the pole. This bolt, to be of the requisite strength, should not be less than three-fourths of an inch in diameter; when bolted into the plough, the upper end or termination of the flat part of the bar should be sixteen to sixteen and a half inches in perpendicular height above the sole of the plough. There are eight square-headed screw-bolts fitted with nuts required for this plough, their diameter should be half an inch, and the thread of the screw the same in all; their lengths vary from two to three and a half inches.

The above is a description of an American plough, which, from a trial made in the Dekhan, promises to become of extensive use in Indian agriculture; and should the expense at which they can be made up in this country be found sufficiently moderate, a large number would probably be required, and in that event, the *entire plough*, as a pattern for the casting, could be sent round to Madras.

It is understood that the prime cost of the plough in America, is, for the larger, 7 or 8 dollars, and for the smaller, 5 dollars. This, however, of course, includes the wood work. A gentleman well acquainted with the subject is of opinion, that the wholesale cost of the iron part in England would be considerably below the American prices.